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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,477	04/15/2005	Piotr Kula	122041	6504
25944 7590 08/15/2008 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
ZHU, WEIPING				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
08/15/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/531,477

**Applicant(s)**

KULA ET AL.

**Examiner**

WEIPING ZHU

**Art Unit**

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**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 30, 2008 has been entered.

### ***Status of Claims***

2. Claims 2-6 are currently under examination wherein no claim has been amended in applicant's amendment filed on June 30, 2008.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In line 5 of claim 2, the phrase "at least 400 °C" is broader than the "up to 400 °C" in line 18, page 2 of the instant specification. A proper correction of claim 2 is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota (US 5,702,540) in view of Stickels et al. (US 4,191,599).

With respect to claim 2, Kubota ('540) discloses a method of vacuum carburizing (i.e. the under-pressure carburizing as claimed) of steel workpieces comprising introducing an active nitrogen carrier into the vacuum furnace chamber until the pressure of  $\leq 1$  kPa (i.e. 10 mbar) is reached (col. 3, lines 10-36) and introducing a carbon carrier into the vacuum furnace chamber when the carburizing temperature is reached (col. 7, lines 35-43). The pressure range of Kubota ('540) overlaps the claimed pressure range. A prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed range within the disclosed range of Kubota ('540) with expected success, because Kubota ('540) discloses the same utility over the entire disclosed range.

Kubota ('540) does not specify the temperatures at which the ammonia is introduced and stopped to be introduced into the vacuum carburizing chamber as claimed. However, it is well held that discovering an optimum value of a result-effective variable involves only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ

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215 (CCPA 1980). In the instant case, the temperatures at which the ammonia is introduced and stopped to be introduced into the vacuum carburizing chamber are result-effective variables, because they would directly affect the nitrogen content, nitrogen penetration depth and the resulting residual compressive stress in the surface region of the steel workpieces as disclosed by Stickels et al. ('599) (col. 1, lines 5-48). See MPEP 2144.05 II. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the nitriding temperature range in order to achieve the desired nitrogen content, nitrogen penetration depth and the resulting residual compressive stress in the surface region of the steel workpieces.

With respect to claims 3 and 4, Kubota ('540) discloses that ammonia gas can be added as a gaseous nitrogen source in addition to the carburizing gas, which reads on the claimed features of the instant claims 3 and 4.

With respect to claim 5, Kubota ('540) discloses that ethylene or acetylene can be used as a carburizing gas (col. 4, lines 33-40), which reads on the claimed feature of the instant claim 5.

With respect to claim 6, Kubota ('540) discloses a carburizing temperature of 930° C (col. 9, lines 7-18), which is close to the claimed lowest temperature of 950°C. A prima facie case of obviousness exists. See MPEP 2144.05 I.

### ***Response to Arguments***

5. The applicant's arguments filed on June 30, 2008 and the 1.132 declaration signed by the 1<sup>st</sup> named inventor Dr. Piotr Kula and filed on June 30, 2008 have been fully considered but they are not persuasive.

The applicant's arguments are largely based upon the experimental results presented in the 1.132 declaration. However, the declaration under 37 CFR 1.132 filed June 30, 2008 is insufficient to overcome the rejection of claim 2 based upon 35 U.S.C. 103(a) as being unpatentable over Kubota ('540) in view of Stickels et al. ('599) as set forth in the last Office action because: the declaration fails to establish the criticality of the lower temperature limit at 400 °C at which the nitrogen carrier is introduced and the upper temperature limit at carburization temperature (e.g. 1000 °C) at which the nitrogen is stopped. The temperature at which the nitrogen was introduced in the Experiments 2 and 4 in the declaration was 20 °C and the temperature at which the nitrogen was stopped in the Experiment 2 in the declaration was 400 °C; while the nitrogen introducing and stopping temperatures for the Experiment 3 in the declaration were 400 °C and 1000 °C respectively, representing the claimed process. The comparison in the declaration was not made with an Experiment having a nitrogen introducing temperature lower than 400 °C (e.g. 360-399) and 1000 °C to establish the criticality of the nitrogen introducing temperature. The results as shown in the declaration would be expected by an ordinary skill in the art. Stickels et al. ('599) discloses that nitriding at temperatures below 1100 degrees F (593 degrees C) is disadvantageous, as shown in the Experiments 2 and 4 in the declaration, and nitriding in an austenitic condition (i.e. at a carburizing temperature) would produce high level of retained austenite (col. 1, lines 34-43), as shown in the Experiments 7 and 8 in the declaration.

### ***Conclusion***

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6. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

WZ

8/7/2008

**Application Number****Application/Control No.**

10/531,477

**Examiner**

WEIPING ZHU

**Applicant(s)/Patent under  
Reexamination**

KULA ET AL.

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